

MULTIMEDIA



UNIVERSITY

STUDENT ID NO

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MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2018/2019

BDS2074 – MANAGEMENT DECISION SCIENCE

(All sections / Groups)

5 MARCH 2019

2.30 p.m – 4.30 p.m

(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of **FOUR (4)** printed pages excluding cover page.
2. Answer **ALL FOUR (4)** questions.
3. Please write all your answers in the Answer Booklet provided.

QUESTION 1 (25 MARKS)

- (a) The production manager for the Whoppy soft drink company is considering the production of two kinds of soft drinks: regular (X_1) and diet (X_2). The company operates eight hours shift per day. During the production process, one of the main ingredients namely syrup, is limited to maximum production capacity of 675 gallons per day. Production of a regular case needs two minutes and five gallons of syrup, while production of a diet case requires four minutes and three gallons of syrup. Profits for regular soft drink are \$3 and profits for diet soft drink are \$2.

i) Formulate the above problem as a Linear Programming Model.

(4 marks)

ii) Develop an initial simplex tableau by including the necessary slack variables.

(6 marks)

- (b) ABC consultant firm has four accountants to be assigned to four different projects. The time (in number of days) for each accountant for each project are shown in the table below. Find the projects that should be assigned to the accountants that will minimize the number of days to complete all the projects:

Accountant	Project			
	W	X	Y	Z
Aliff	10	10	9	7
Baba	8	9	8	11
Chong	12	14	10	9
Daisy	11	13	9	12

(15 marks)

Continued...

QUESTION 2 (25 MARKS)

Marina Company faces the problem of supplying school meals from three caterers to four schools. The number of meals required at the four schools A, B, C and D are given: 130, 95, 75 and 100 respectively. The transportation cost in MYR, the number of supplies and the number of demands are provided as below:

Caterer	School				Supply
	A	B	C	D	
X	6	2	6	3	120
Y	14	9	5	4	80
Z	8	4	3	5	150
Demand	130	95	75	100	

Find the optimum transportation schedule that minimizes the transportation cost.

Continued...

QUESTION 3 (25 MARKS)

Mazanico Sdn Bhd plans to develop a new graphic calculator. The following table provides a list of activities that must be accomplished to produce the calculators:

Activity	Immediate Predecessors	Duration (Weeks)		
		Optimistic	Most Likely	Pessimistic
A	-	4	6	8
B	-	3	5	7
C	A	2	3	4
D	A	4	5	6
E	A	0.5	1	1.5
F	B,C	2	4	6
G	B,C	1	2	3
H	E,F	3	6	9
I	E,F	2	5	8
J	D,H	2	3	4
K	G,I	3	5	7

- (a) Determine the expected duration time for each activity. (4 marks)
- (b) Construct a drawing of appropriate network for above listed activities. (4 marks)
- (c) Identify the critical path and the expected completion time of the project. Determine the earliest start time, latest start time, earliest finish time, latest finish time and slack time. (17 marks)

Continued...

QUESTION 4 (25 MARKS)

For the upcoming planting season, Farmer McCoy can plant corn, wheat, soybeans or he can use the land for grazing. The payoffs associated with the different actions are influenced by the amount of rain: heavy rainfall, moderate rainfall, light rainfall or drought. The probabilities for each amount of rain are 0.2, 0.4, 0.3 and 0.1, respectively. The payoff is estimated as below:

Alternative	Level of rainfall			
	Heavy (\$)	Moderate (\$)	Light (\$)	Drought (\$)
Plant corn	-20 000	60 000	30 000	-5 000
Plant wheat	40 000	50 000	35 000	0
Plant soybeans	-50 000	100 000	45 000	-10 000
Grazing the land	12 000	15 000	15 000	10 000
Probabilities	0.2	0.4	0.3	0.1

- (a) Which decision should Farmer McCoy select if he wants to minimize his expected loss?
(6 marks)
- (b) Farmer McCoy believes that there is only 70% chance of success for each alternative. Which decision do you recommend to McCoy?
(5 marks)
- (c) State the best decision which Farmer McCoy believes that there is an equally likely chance for success.
(4 marks)
- (d) Determine the best alternative through Expected Monetary Value (EMV) criterion.
(6 marks)
- (e) Find the best alternative through Maximin decision.
(4 marks)

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